

**Twin-wire former****Claims**

5 1. A twin-wire former (1) for producing a fibrous web (4), in particular a paper, board or tissue web, from a fibrous stock suspension, having the following features:

10 a) two endless wire belts (lower wire (2) and upper wire (3)) together form a twin-wire zone (5);

15 b) in a first section of the twin-wire zone (5), in which the two wire belts (2, 3) run over a dewatering element in the form of a rotating forming roll (7), the two wire belts (2, 3) together form a wedge-like inlet gap (8) which picks up the fibrous stock suspension directly from a flowbox (9) fitted at an angle ( $\delta$ ) relative to an imaginary first horizontal plane (H1) ("gap former");

20 c) in a second section of the twin-wire zone (5), the two wire belts (2, 3) with the fibrous web (4) forming between them run downward over further dewatering elements (6) at an angle ( $\alpha$ ) of  $10^\circ$  to  $60^\circ$  relative to an imaginary first vertical plane (V1);

25 d) at the end of the second section of the twin-wire zone (5), the two wire belts (2, 3) run over a first deflection device (10) with a lower vertex (10.SU) and then over at least one separating device (11) which acts over the machine width and in the area of which one of the wire belts (2, 3) is led away from the forming fibrous web (4) and the other wire belt (2, 3);

30 e) a second deflection device (15) with an upper vertex (15.SO) is arranged after the separating

device (11) and deflects the wire belt (2) that carries the forming fibrous web (4);

characterized

f) in that after the first deflection device (10),

5 the two wire belts (2, 3) run upward at an angle ( $\beta$ ) relative to an imaginary second horizontal plane (H2) in such a way that the upper vertex (15.SO) of the second deflection device (15) is located above the lower vertex (10.SU) of the first deflection device (10),  
10 and

g) in that the angle ( $\delta$ ) runs downward relative to the imaginary first horizontal plane (H1).

15 2. The twin-wire former (1) as claimed in claim 1,  
characterized in that

the upper vertex (15.SO) of the second deflection device (15) is located at least 50 mm, preferably at least 100 mm, in particular at least 200 mm,  
20 above the lower vertex (10.SU) of the first deflection device (10).

3. The twin-wire former (1) as claimed in claim 1 or  
2,

25 characterized in that

the angle ( $\delta$ ) assumes a value between  $0^\circ$  and  $45^\circ$ ,  
preferably between  $0^\circ$  and  $30^\circ$ .

4. The twin-wire former (1) according to the preamble  
30 of claim 1,  
characterized

35 f) in that after the first deflection device (10),  
the two wire belts (2, 3) run upward at an angle ( $\beta$ ) relative to an imaginary second horizontal plane (H2),

g) in that a felt (23) removes the forming fibrous web (4) from the wire belt (2) at a pickup point ( $S_p$ ), which is located above the lower

vertex (10.SU) of the first deflection device (10), and

5 h) in that the pickup point ( $S_p$ ) is followed by a press unit (24), in which the forming fibrous web (4) is guided first through a first, preferably double-felted press nip (25) with a first press roll (26) and a second press roll (27), after the first press nip (25) is guided, with one of the felts (23), around the first press roll (26), is then transferred to a non-felted press roll (29) in a second press nip (28) and then runs through at least one further single-side-felted press nip (30).

10 15 5. The twin-wire former (1) as claimed in claim 4, characterized in that the pickup point ( $S_p$ ) is located at least 50 mm, preferably at least 100 mm, in particular at least 200 mm, above the lower vertex (10.SU) of the first deflection device (10).

20 25 6. The twin-wire former (1) as claimed in one of the preceding claims, characterized in that

the angle ( $\beta$ ), at which the two wire belts (2, 3) run upward in relation to an imaginary second horizontal plane (H2) after the first deflection device (10), assumes a value between 10° and 90°, preferably between 25° and 40°.

30 35 7. The twin-wire former (1) as claimed in one of the preceding claims, characterized in that

isobaric dewatering elements (18, 19), as they are known, are arranged between the first deflection device (10) and the separating device (11), between which the forming fibrous web (4) runs, enclosed between the two wire belts (2, 3).

8. The twin-wire former (1) as claimed in claim 7,  
characterized in that  
at least one stationary isobaric dewatering  
5 element (18) is arranged on the one wire belt (2,  
3), and at least one isobaric dewatering element  
(19) is arranged on the other wire belt (2, 3) and  
can be set resiliently against the wire belt (2,  
3) by means of a selectable force.

10 9. The twin-wire former (1) as claimed in claim 7 or  
8,  
characterized in that  
the isobaric dewatering elements (18, 19) are  
15 designed as plates or as plate segments.

10. The twin-wire former (1) as claimed in one of the  
preceding claims,  
characterized in that  
20 after the separating device (11), there is  
arranged at least one flat suction element (20),  
which acts on the wire belt (2) which carries the  
forming fibrous web (4).

25 11. The twin-wire former (1) as claimed in one of the  
preceding claims,  
characterized in that  
at the second deflection device (15), deflection  
of the wire belt (2) is carried out in such a way  
30 that the wire belt (2) subsequently runs downward  
at an angle ( $\gamma$ ) less than  $60^\circ$ , preferably less  
than  $40^\circ$ , in particular less than  $25^\circ$ , relative to  
an imaginary second vertical plane (V2).

35 12. The twin-wire former (1) as claimed in one of  
claims 1 to 10,  
characterized in that

at the second deflection device (15), deflection of the wire belt (2) is carried out in such a way that the wire belt (2) subsequently runs substantially horizontally.

5

13. The twin-wire former (1) as claimed in claim 12, characterized in that the wire belt (2) runs over the lower vertex (10.SU) of the first deflection device (10).

10

14. The twin-wire former (1) as claimed in claim 13, characterized in that the wire belt (2) runs at least 50 mm, preferably at least 100 mm, above the lower vertex (10.SU) of the first deflection device (10).

15

15. The twin-wire former (1) as claimed in one of the preceding claims, characterized in that a further sheet forming device (22), preferably a hybrid former, is arranged after the second deflection device (15).

20

16. The twin-wire former (1) as claimed in one of the preceding claims, characterized in that the second deflection device (15) is a suction roll (13), a shoe (21) with foils or a shoe with foils and with applied vacuum.

25

17. The twin-wire former (1) as claimed in one of the preceding claims, characterized in that the distance (A) between the lower vertex (10.SU) of the first deflection device (10) and the upper vertex (15.SO) of the second deflection device (15) assumes a value between 1 and 8 m, preferably between 3 and 6 m.

30

35

SEARCHED  
INDEXED  
COPIED  
FILED

18. The twin-wire former (1) as claimed in one of the preceding claims,  
characterized in that  
5 the first deflection device (10) is a closed roll (16), an open roll or an open roll with applied vacuum.

19. The twin-wire former (1) as claimed in one of the preceding claims,  
10 characterized in that  
the separating device (11) is designed as a suction separator (17) and/or as a vacuum shoe.

15 20. The twin-wire former (1) as claimed in one of the preceding claims,  
characterized in that  
the forming roll (7) has a diameter (D7) of greater than 1200 mm, preferably greater than  
20 1635 mm, in particular greater than 1760 mm.

21. The twin-wire former (1) as claimed in one of the preceding claims,  
characterized in that  
25 the forming roll (7) has a dewatering capacity which has a value of at least 50%, preferably of at least 65%, of the total dewatering capacity of the twin-wire former (1).

30 22. The twin-wire former (1) as claimed in one of the preceding claims,  
characterized in that  
the forming roll (7) is designed as an open roll.

35 23. The twin-wire former (1) as claimed in claim 22,  
characterized in that  
the open forming roll (7) is closed by means of a grille or honeycomb structure.

24. The twin-wire former (1) as claimed in claim 22,  
characterized in that  
the open forming roll (7) is a suction roll.

5

25. The twin-wire former (1) as claimed in one of the  
preceding claims,  
characterized in that  
the roll diameter (D16) of the deflection roll  
10 (16) is greater than the roll diameter (D7) of the  
forming roll (7) and/or the roll diameter (D13) of  
the suction roll (13).

15

26. The twin-wire former (1) as claimed in one of the  
preceding claims,  
characterized in that  
it has an overall height (H) in a range from 2 to  
8 m, preferably from 3 to 6 m.

20 27. Use of the twin-wire former (1) as claimed in one  
of the preceding claims, in particular in a former  
rebuild.